

In the Claims:

1. An envelope insert conveyor assembly, comprising:
a first pair of rotation members and a second pair of rotation members spaced apart from one another;
a first conveying member disposed around the first pair of rotation members and a second conveying member disposed around the second pair of rotation members, so as to rotate around the first rotation member and the second rotation member; and
a plurality of pusher members fixed to each of the first conveying member and second conveying member, each pusher member comprising paired sidewalls, a cross-wall connecting the paired walls, an indented portion provided in each of the paired sidewalls, and a gripping element disposed adjacent an indented portion of one of the paired sidewalls and biased toward an interior surface of the indented portion.
2. An envelope insert conveyor assembly according to claim 1, wherein:
the first pair of rotation members and the second pair of rotation members comprise sprockets, and
each of the first conveying member and second conveying member comprises a chain.
3. An envelope insert conveyor assembly according to claim 1,
wherein the gripping element comprises a gripping member which is resiliently biased toward an interior lower surface of the indented portion.

4. An envelope insert conveyor assembly according to claim 3,
wherein each of the first conveying member and second conveying member chains comprises a plurality of chain links, each chain link comprising an outer set of link elements and an inner set of link elements;

wherein each of the pusher members comprises downwardly protruding extensions corresponding in shape and spacing to one of the outer set of link elements and inner set of link elements;

wherein the pusher members are connected to the first conveying member and second conveying member chains by the downwardly protruding extensions.

5. An envelope insert conveyor assembly according to claim 1,
wherein the plurality of pusher members are spaced along the each of the first conveying member and second conveying member by a substantially uniform distance.

6. An envelope insert conveyor assembly according to claim 1,
wherein the indented portion is dimensioned to receive an insert comprising at least one of a sheet of paper, plural sheets of paper, a packet, a folded sheet of paper, and plural folded sheets of paper.

7. An envelope insert conveyor assembly according to claim 1,
wherein the gripping element gripping member is biased by a spring against the insert under action of the spring toward the interior lower surface of the indented portion to retain the insert within the indented portion during motion of the gripping element.
8. An envelope insert conveyor assembly according to claim 7,
wherein each gripping element comprises a gripping member mounted for rotation about a pivot point formed by a pin inserted through a hole in a forwardly extending portion of a corresponding pusher member.
9. An envelope insert conveyor assembly according to claim 8,
wherein the pivot point of the gripping member is within a middle portion of the gripping member,
wherein an attachment point for one end of the spring is within an upper portion of the gripping member, and
wherein an attachment point for another end of the spring is provided on the pusher member.
10. An envelope insert conveyor assembly according to claim 9,
wherein a lower portion of the gripping member comprises a curved portion, and
wherein a middle portion of the curved portion is configured to contact the interior lower surface of the indented portion, and

wherein a distal end of the curved portion curves upwardly away from the interior lower surface of the indented portion.

11. An envelope insert conveyor assembly according to claim 10,
wherein the attachment point provided on the pusher member for said another end of the spring is disposed on a forward portion of a pusher member sidewall.

12. An envelope insert conveyor assembly according to claim 11, further comprising:
a supporting member attached to the conveyor chain behind each of the pusher members,
wherein each of the supporting members comprises downwardly protruding extensions
corresponding in shape and spacing to one of the outer set of link elements and inner set of link
elements;

wherein the supporting members are connected to the first conveying member and second
conveying member chains by the downwardly protruding extensions.

13. An envelope insert conveyor assembly according to claim 12,
wherein a rear portion of each of the pusher members comprises a recess,
wherein the supporting members comprise a generally H-shaped element having two
upwardly directed walls and a horizontal cross-wall, the upwardly directed walls comprising
forward projections configured to engage the recesses in the rear portion of the pusher members
when a respective one of the conveying members is moving in a substantially straight line and is

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configured to at least partially disengage from the recesses in the rear portion of the pusher elements when a respective one of the conveying members moves along a curved path, and wherein the engagement of the supporting member forward projections and the pusher members supports the pusher members.

14. An envelope insert conveyor assembly according to claim 13, wherein the gripping member is configured to pivot inwardly into the indented portion of the pusher member when an insert encounters a leading edge of the gripping member, and wherein the inward pivoting motion exposes a height-wise portion of the indented portion sufficient to receive the insert.

15. An envelope insert conveyor assembly according to claim 1, further comprising: an assist member comprising one or more rollers; and a continuous motion inserting machine, wherein the assist member is provided upstream of the continuous motion inserting machine to control the inserts prior to engagement of each insert by the pusher members.

16. An envelope insert conveyor assembly according to claim 15, further comprising: a lower guide plate and an opposing upper guide plate provided downstream of the assist member, wherein the lower guide plate and upper guide plate are positioned to control movement of envelopes prior to contact between the insert borne by the pusher members and the envelopes.

17. An envelope insert conveyor assembly according to claim 16,
wherein the envelopes are conveyed in a position wherein a leading edge of the envelope is the bottom edge of the envelope and an open flap of the envelope is the trailing edge.

18. An envelope insert conveyor assembly according to claim 17, further comprising:
a lower vacuum member provided adjacent the lower guide plate to face an envelope path,
an upper vacuum member provided in opposition to the lower vacuum member,
wherein the upper vacuum member and lower vacuum member coact to at least partially open each envelope and prepare each envelope for receipt of an insert carried by a corresponding pair of pusher members.

19. An envelope insert conveyor assembly according to claim 18, further comprising:
a third pair of rotation members having a third conveying member disposed therearound;
a fourth pair of rotation members having a fourth conveying member disposed around therearound, the third conveying member and fourth conveying member being spaced apart from one another, and
a plurality of inserting fingers disposed on the third conveying member and fourth conveying member,

wherein the movement of the third conveying member and fourth conveying member causes the plurality of inserting fingers to approach each of the open envelopes from the rear prior to contact between the insert borne by the pusher members and each of the open envelopes.

20. An envelope insert conveyor assembly according to claim 19,
wherein inserting fingers on the third conveying member engage inner surfaces of one of the left and right sides of each of the open envelopes,
wherein inserting fingers on the fourth conveying member engage inner surfaces of the other one of the left and right sides of each of the open envelopes, and
wherein outer surfaces of the inserting fingers space apart the upper and lower sides of each of the open envelopes to facilitate insertion of an insert conveyed by the pusher members.

21. An envelope insert conveyor assembly according to claim 20,
wherein at least one of the lower vacuum member and upper vacuum member disengages from a respective one of the open envelope bottom surface and the open envelope top surface substantially concurrent with a substantially full insertion of the inserting fingers therein.

22. An envelope insert conveyor assembly according to claim 21,
wherein the inserting fingers are substantially U-shaped in cross-section, and
wherein an inner portion of the U-shaped cross section is configured to guide inserts borne by the pusher members into a corresponding one of the plurality of open envelopes.

23. An envelope insert conveyor assembly according to claim 22, wherein a differential velocity of the pusher members and the insertion fingers is selected so that, upon at least substantial insertion of each insert into each of a corresponding one of the plurality of open envelopes to form stuffed envelopes, the forward motion of the pusher members removes the stuffed envelopes from the insertion fingers.

24. An envelope insert conveyor assembly according to claim 22, further comprising: a rotating output drum powered by a power source, wherein the linear velocity of an outer surface of the rotating output drum is greater than a linear velocity of the pusher members, and

wherein the rotating output member accelerates the stuffed envelopes away from the pusher members following disengagement of the combined envelope and insert from the insertion fingers.

25. An envelope insert conveyor assembly according to claim 24, further comprising: a stabilizing roller disposed above the path of the stuffed envelopes and above the rotating output drum to provide a slight downwardly biasing force to stabilize the stuffed envelopes as they are accelerated by the rotating output drum.

26. A pusher member for conveying an envelope insert, comprising:
paired sidewalls;
a cross-wall connecting the paired walls;

wherein each of the paired sidewalls comprises, at a proximal end, downwardly protruding extensions comprising an attachment member adapted for attachment to a chain,

wherein each of the paired sidewalls comprises a forwardly disposed generally U-shaped indented portion,

wherein one of the generally U-shaped indented portions comprises a gripping element having a gripping member which is resiliently biased toward an interior surface of the indented portion.

27. A pusher member for conveying an envelope insert according to claim 26, wherein the attachment member corresponds in configuration to one of an outer set of link elements and an inner set of link elements of a drive chain.

28. A pusher member for conveying an envelope insert according to claim 26, wherein the generally U-shaped indented portions are dimensioned to receive an insert comprising at least one of a sheet of paper, plural sheets of paper, a packet, a folded sheet of paper, and plural folded sheets of paper, and

wherein the gripping element gripping member is biased by a spring toward an interior surface of the indented portion.

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29. A pusher member for conveying an envelope insert according to claim 28,
wherein a lower portion of the gripping member comprises a curved portion, and
wherein a middle portion of the curved portion is configured to contact the interior lower
surface of the indented portion, and
wherein a distal end of the curved portion curves upwardly away from the interior lower
surface of the indented portion.